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CHILTON'S SEPTEMBER 1989

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COMMERCIAL CARRIER JOURNAL

HOW TO BURY YOUR UNDERGROUND TANK PROBLEMS

MAYBE!

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Product Evaluation: Nissan's UD 2800

Synthetic Lubes: A Slick Way To Lower Costs

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VOLUME 146 NUMBER 9 SEPTEMBER 1989

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THEY COULD MAKE 'EM DANCE

That was the impression left with movie makers working on the new James Bond movie "License to Kill," for which Kenworth Truck Co. engineers were asked to do some special engineering on a few trucks to be used in the movie's stunt scenes. This picture is one of two we thought you would enjoy. Our favorite can be found in *SideRoads* on the last page of this issue.

One stop shopping...

...is what the CCJ October Buyer's Guide offers through annually updated listings of thousands of suppliers of commercial vehicle products and services. The issue also provides a couple of dozen pages on light, medium and heavy-duty truck makes and models and major component specs. It's a valuable reference tool to use all year. □

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Navistar's Smokeless Diesel beats '94 emissions

By PAUL RICHARDS Technical Editor 215-964-4519

Navistar International Transportation Corp., Chicago, provided a peek at the technology it will use to meet stringent federal standards for exhaust emission levels, scheduled to take effect in 1994.

According to Navistar, the International 94 Smokeless Diesel puts out a mere .08 grams per horsepower-hour of particulate matter, beating the 1994 emission standard of .10 g/bhp-hr. The engine's emissions are also well below 1994 standards for hydrocarbons (HC), oxides of nitrogen (NOx) and carbon monoxide (CO). In addition, Navistar claims the engine will produce lower emission levels than methanol or gasoline fueled engines of comparable horsepower—in all emission categories.

This is especially significant, since there has been widespread concern among diesel engine makers as to whether the 1994 standards can be met. Beating the standards by five years is a pretty slick trick.

A prototype of the 94 Smokeless Diesel was unveiled in July at the International Trucking Show, Anaheim, Calif., and drew lots of attention. Based on Navistar's DT 466, 210-hp engine, the 94 uses ultra-high injection pressures, a revised combustion chamber and catalytic converters to achieve its low emission levels.

To prevent plugging of the catalytic converters, low-sulfur (.05%) fuel must be used in the 94. But this shouldn't be a problem, since such fuel is expected to be widely available about a year before the engine goes to market in 1994.

One struggle faced by engineers in search of lower emissions is the trade-off between oxides of nitrogen and particulates. Invariably, when you lower one, you raise the other. For instance, one way to lower NOx is to retard the injection timing, which lowers the combustion temperature. But, since the fuel is not burned as efficiently, the result is more particulates. The 94 is both turbocharged and air-to-air aftercooled. Aftercooling, say Navistar engineers, reduces NOx, without sacrificing combustion efficiency.

The 94's pistons and rings were designed for maximum air utilization and minimum oil consumption. In addition, there is what Navistar calls a re-entrant chamber at the top of each piston that provides more efficient mixing of air and fuel. These features were designed to help lower carbon black in particulate emissions.

High-pressure fuel injection on the 94 prototype is accomplished by means of a pump-and-line system. The rate of injection is mechanically controlled, although the pump is electronically governed.

For the production 94 engine, electronically-controlled unit injectors, like those used in Detroit Diesel DDEC-equipped engines and Caterpillar's new 3176 engine, will be used. Unit injectors will be supplied by Caterpillar.

Another difference between 94 prototype and production engines is that the prototype uses two catalytic converters—production engines will use only one. Between now and the engine's scheduled introduction, a large part of Navistar's development work will involve field testing that converter. By law, the converter must be capable of going 150,000 miles without a failure. So far, durability has only been demonstrated to 50,000 miles.

But Navistar officials are confident they'll meet their goals. "We believe we can achieve an additional 25% reduction on NOx," said John Horne, vice president and general manager of Navistar's Engine and Foundry Div. "We believe we can do it without significant cost increases, major fuel economy penalties or further changes in fuels. □

	Emission Levels		1994 Model Year Emissions Standards g/bhp-hr			
POLLUTANT	Navistar Diesel Prototype g/bhp-hr Performance	Methanol Prototype g/bhp-hr Performance	Heavy-duty Diesel	Heavy-duty Methanol	Light-Duty Gasoline	Heavy-Duty Gasoline
Particulate Matter	0.08	0.12	0.10	0.10	None	None
HC	0.30	1.6	1.3	1.3	1.1	1.9
NOx	4.44	3.60	5.0	5.0	5.0	5.0
CO	1.37	6.4	15.5	15.5	14.4	37.1
Formaldehyde	0.047	0.16	NR	0.5		

Emission levels for Navistar 94 Smokeless Diesel not only beat 1994 standards for diesels, but for gasoline and methanol as well.